

APPENDIX I

GLOSSARY

ALUMINUM CREEP—The movement of aluminum wire away from a point where pressure is applied. (2)
The retreat of heated aluminum wire as it cools.

AMBIENT TEMPERATURE—The "surrounding temperature"—as the temperature surrounding a conductor in a compartment or within a piece of equipment.

AMERICAN WIRE GAUGE (AWG)— The standards adopted in the United States for the measurement of wire sizes.

ANTISEIZE COMPOUND—A silicon-based, high-temperature lubricant applied to threaded components to facilitate their removal after being subjected to rapid heating and cooling.

ASBESTOS—A fiber-like mineral, noncombustible and nonconductive, used as an insulating material.

BLOCK DIAGRAM—A diagram in which the major components of a piece of equipment or of a system are represented by squares, rectangles, or other geometric figures, and the normal flow of a signal or current is represented by lines.

BRAID—The weaving of metal or cloth material as an outer coating to a cable; prevents cable damage from moisture and rough treatment.

BRANCH—An individual current path in a parallel circuit.

BUS BAR—A heavy copper strap or bar used to connect several circuits together when a large current-carrying capacity is required.

CABLE—Either a stranded conductor (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable). Small cable sizes are called stranded wire or cords.

CENTIMETER CUBE—A unit of volume for large rectangular or square conductors. The cross-sectional area equals 1 square centimeter with a length of 1 centimeter.

CIRCULAR MIL—The area of a circle having a diameter of 1 mil. The standard unit of measurement of wire cross-sectional area. One circular mil equals .7854 square mils.

CIRCULAR-MIL-FOOT—A unit of volume of a conductor having a cross-sectional area of 1 circular mil and a length of 1 foot.

COAXIAL CABLE—A cable made up of a center conductor separated from an outer conductor by a dielectric material. Normally used for radio-frequency transmission.

COMPRESSED AIR/NITROGEN HEATING TOOL—A portable source of heat for use with heat-shrinkable products.

CONDUIT—A tubular raceway, usually metal or plastic, for enclosing wires or cables.

CONDUCTANCE—The ability of a material to conduct or carry an electric current. It is the reciprocal of the resistance of the material.

CORONA—The discharge of electricity from a conductor with a high potential.

CURRENT RATING—The safe current-carrying capacity of a wire or cable on a continuous basis.

DIELECTRIC STRENGTH—The ability of an insulator to withstand a potential difference without breaking down. (Usually expressed in terms of voltage).

DUCTILE—Easily drawn out-as to form filaments or wires.

ELECTRICAL SYMBOLS—Graphic symbols used to illustrate the various electrical or electronic components of a circuit.

ELECTROLYSIS—The process of changing the chemical composition of a material by passing an electric current through it.

ELECTROSTATIC STRESS—The force exerted on an insulator by the voltage in a conductor.

ENAMEL—Synthetic compound of cellulose acetate (wood pulp and magnesium). Used to insulate wire in meters, relays, and motor windings.

EXTRUDED POLYTETRAFLUOROETHYLENE—A high-temperature insulation used extensively in aircraft and equipment installations. (Emits dangerous fumes when heated.)

FEP Fluorinated Ethylene Propylene—A synthetic type of insulation.

FIBROUS BRAID—An outer covering used to protect the insulating material of a conductor. Commonly made from cotton, linen, silk, rayon, or fiberglass.

FLUX—A material that removes oxides from surfaces to be joined by soldering or welding.

GALVANOMETER—A meter used to measure small values of current by electromagnetic or electrodynamic means.

HEAT-SHRINKABLE TUBING—A plastic tube that, when heated, shrinks to encapsulate, protect, or insulate connections, splices, terminations, and other configurations.

HEAT SHUNT—A device (preferably a clip-on type) used to absorb heat and protect heat-sensitive components during soldering.

INSULATION—Materials used to coat or wrap conductors to prevent current leakage.

INSULATION RESISTANCE—The resistance offered by an insulating material to current leakage.

ISOMETRIC DIAGRAM—A diagram showing the outline of a ship or aircraft or equipment, and the location of equipment and cable runs.

JUNCTION BOX—A box with a cover for joining different runs of wire or cable and for providing space for the connection and branching of the enclosed conductors.

LACING SHUTTLE—A device upon which lacing may be wound to prevent fouling the tape or cord and facilitate the lacing process. (Usually made from brass, aluminum, fiber, or plastic.)

LEAD SHEATH—A continuous jacket of lead molded around a single-conductor or multiple-conductor cable. Generally used to ensure that conductors are protected from water or extensive moisture.

MAGNET WIRE—Wire coated with an enamel insulation and used in coils, relays, transformers, motor windings, and so forth.

METALLIC ARMOR—A protective covering for wires or cables. Made as a woven wire braid, metal tape, or interlocking metal cover. Made from steel, copper, bronze, or aluminum.

MIL—The diameter of a conductor equal to 1/1000th (.001) inch.

MIL-FOOT—A unit of measurement for conductors. (Diameter of 1 mil, 1 foot in length.)

MILITARY SPECIFICATIONS (MIL-SPEC)—Technical requirements and standards adopted by the Department of Defense, which are to be met by vendors selling materials to DOD.

MULTICONDUCTOR—More than one conductor.

NEGATIVE TEMPERATURE COEFFICIENT—The temperature coefficient expressing the amount or reduction in the value of a quantity, such as resistance for each degree of increase in temperature.

OXIDATION—The addition of atmospheric oxygen to metal to form rust, or to cause a breakdown in the internal construction of the metal.

PETROLEUM ABRASIVE COMPOUND—A compound that causes a grinding action during the crimping operation and removes the oxide film from the aluminum.

PICTORIAL DIAGRAM—A diagram showing pictorial sketches of the parts of a piece of equipment and the electrical connections between the parts.

POWER LOSS—The electrical power supplied to a circuit that does no work, usually dissipated as heat.

RECEPTIVITY—The reciprocal of conductivity. (See also SPECIFIC RESISTANCE.)

RHEOSTAT—(1) A resistor whose value can be varied. (2) A variable resistor used to adjust the current in a circuit.

RHO—Greek letter "rho" (ρ). Used in electricity and electronics to represent the specific resistance of a substance.

SCHEMATIC—A diagram that shows, in graphic symbols, the electrical connections and functions of a specific circuit arrangement. The schematic diagram makes tracing the circuit and its functions easier without regard to the physical size, shape, or location of the component device or parts.

SINGLE-LINE DIAGRAM—A diagram that shows, in single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used in the circuit(s).

SOLDERING—The joining of metals with a higher melting point than solder.

SPAGHETTI TUBING—(See TRANSPARENT TUBING.)

SPECIFIC RESISTANCE—The resistance, measured in ohms, of a unit volume of a substance to the flow of electric current. (The unit volume used is generally the Circular-Mil-Foot.)

SPLICE—A joint formed by connecting two or more conductors.

SQUARE MIL—The area of a square, the sides of which are each equal to 1 mil. One square mil is equal to 1.2732 circular mils.

STRANDED CONDUCTOR—A conductor composed of a group of wires. The wires in a stranded conductor are usually twisted together and not insulated from each other.

STRANDS—Fine metallic filaments twisted together to form a single wire.

TEMPERATURE COEFFICIENT OF RESISTANCE—The amount of increase in the resistance of a 1-ohm sample of a conductor per each degree of rise in temperature above 0° C.

TENSILE STRENGTH—The greatest stress a substance can withstand along its length without tearing apart.

TERMINAL—A point of connection for two or more conductors in an electrical circuit.

TERMINAL BOARD—(Also called a terminal strip.) An insulating base or slab equipped with terminals for connecting wiring.

TERMINAL DIAGRAM—A diagram of a switch, relay, terminal board, or other component showing the connections to the equipment.

TERMINAL LUG—A device attached to a conductor for connecting to a terminal.

THERMAL INERTIA—The capacity of a soldering iron to generate and maintain a satisfactory soldering temperature while giving up heat to the material being soldered.

THERMISTOR—A semiconductor device whose resistance varies with temperature.

THERMOPLASTIC—A synthetic mixture of rosins that is flexible and used as an insulating material. Generally used as an insulator for low- and medium-range voltages.

TINNING—The process of applying a thin coat of solder to materials prior to their being soldered (for example, application of a light coat of solder to the filaments of a conductor to hold the filaments in place prior to soldering the conductor).

TOXIC VAPORS—Vapors emitted by a substance that can do bodily harm.

TRANSPARENT TUBING—(Also known as spaghetti tubing.) A plastic tubing used for insulation and wire marking.

UNIT SIZE—The standards adopted to make comparisons between things of like value (for example, the unit size for conductors is the mil-foot).

VARNISHED CAMBRIC—Cotton cloth coated with insulation varnish. An insulation used on high-voltage conductors.

VOLTAGE DROP—The difference in voltage between two points. It is the result of the loss of electrical pressure as a current flows through a resistance.

WIRE—A solid or stranded group of solid, cylindrical conductors having low resistance to current flow, with an associated insulation.

WIRE STRIPPERS—A tool used to strip insulation from wire.

WIRING DIAGRAM—A diagram that shows the connections for an installation or for its component devices or parts. The diagram may show internal or external connections, or both, and also show the details needed to make or trace the connections involved.

APPENDIX II

ELECTRICAL AND ELECTRONIC SYMBOLS

GROUND



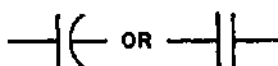
RESISTOR



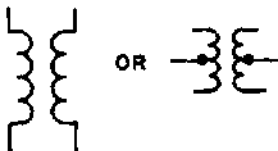
RHEOSTAT



CAPACITOR



TRANSFORMER



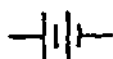
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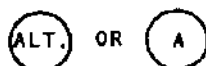
FUSE



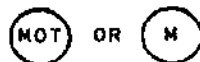
BATTERY



ALTERNATOR



MOTOR



LAMPS



DUAL ELEMENT



SINGLE ELEMENT

SPARK GAP



SWITCHES



LOCKING



MOMENTARY

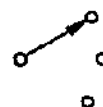


FOOT OPERATED
DOUBLE THROW LOCKING



FOOT OPERATED
MOMENTARY

SWITCHES (Contd)



SELECTOR

CLOSES ON RISING PRESSURE



OPENS ON RISING PRESSURE



PRESSURE OR VACUUM-ACTUATED
SWITCH



PUSH PULL



ROTARY

APPENDIX III

REFERENCES USED TO DEVELOP THE TRAINING MANUAL

Aircraft Electric and Electronic Wiring, NAVAIR 01-1A-505, Naval Air Systems Command, Washington, DC, June 1988.

Dictionary of Standard Terminal Designations for Electronic Equipment, NAVSEA 0967-LP-146-0010, Bureau of Ships, Washington DC, March 1954

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National Electrical Code, National Fire Protection Association, Battery March Park, Quincy, MD, 1990.

Navy Occupational Safety and Health (NAVOSH) Program Manual, SPAWARINST 5100.9C, Space and Naval Warfare Systems Command, June 1987.

Subsystem Design and Engineering Standards for Common Long Haul/Tactical Cable and Wire Communications, MIL-STD-188-112, Department of Defense, Washington, DC, August 1983.

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